



**UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
-----------------	-------------	----------------------	---------------------

09/453,509 12/03/99 BEVERINA

A 8594-001-64

024510 TM02/0212  
PIPER MARBURY RUDNICK & WOLFE LLP  
STEVEN B KELBER  
1200 NINETEENTH STREET, NW  
WASHINGTON DC 20036-2412

EXAMINER

BRODA, S

ART UNIT

PAPER NUMBER

2123

DATE MAILED:

02/12/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/453,509

Applicant(s)

BEVERINA ET AL.

Examiner

Samuel S. Broda

Art Unit

2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 03 December 1999.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims 13-41 are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☒ Other: *Rule 105 Request*.

Art Unit: 2123

### **DETAILED ACTION**

1. Claims 1-41 have been examined.

#### ***Election/Restriction***

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-12, drawn to a system and method of assessing a risk of a terrorist attack based partially on a determination of an accessibility site and a probability that a terrorist attack will occur, classified in class 703, subclass 2.
  - II. Claims 13-32, drawn to a method of assessing risk using an artificial intelligence network to calculate a relative risk based on a probability and vulnerability, classified in class 706.
  - III. Claims 33-41, drawn to an apparatus for assessing risk including a database and a simulation and gaming environment used to determine a threat vector and a likelihood that the threat will succeed, class 703, subclass 6.

2.1 The inventions are distinct, each from the other because of the following reasons: Inventions I, II, and III are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together, or they have different modes of operation, or they have different functions, or they have different effects. (MPEP Sections 806.04 and 808.01).

In this case the inventions have different modes of operation and functions. Invention I includes in its mode of operation the construction of a model of a site of a terrorist attack, and

Art Unit: 2123

functions as an aid in assessing a risk of terrorist attack wherein the risk is determining using a probability and accessibility estimate.

Invention II includes in its mode of operation the use of an artificial intelligence network to calculate a probability and a vulnerability, and lacks the site modeling capability of Invention I; Invention II functions as a risk assessment tool calculating a risk using factors distinct from those used for Invention I.

Invention III includes in its mode of operation a simulation and gaming environment requiring user input, unlike modes of operation used for Inventions I and II; Invention III functions as a risk assessment tool calculating a risk using factors distinct from those used for either Inventions I or II. Because these inventions are distinct and the searches required for each group are independent, restriction for examination purposes is proper.

**2.3** Telephone calls were made to Mr. James Heintz (Applicants' representative, Reg. No. 41,828) on 24 and 25 January 2001 to request an oral election to the above restriction requirement. On 29 January 2001, Applicants' representative agreed to elect claims 1-12 with traverse. Applicants are requested to formally cancel claims 13-41 as part of any response to this office action.

### ***Drawings***

**3.** This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

Art Unit: 2123

*Specification*

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicants' cooperation is requested in correcting any errors of which Applicants may become aware in the specification.

*Claim Rejections - 35 U.S.C. § 112, First Paragraph*

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5.1 Claims 1-12 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

5.2 The disclosure describes a method and system used to determine a risk based on a determination of an accessibility of a site and a probability that a terrorist attack will occur. However, the disclosure fails to provide guidance regarding the calculations of accessibility and probability to permit one skilled in the art to make and/or use invention, without undue experimentation.

According to the Specification at page 5 (emphasis added):

The system also provides an artificial intelligence risk assessment tool to help users manage risk. After the simulation has been run, the risk assessment tool determines

Art Unit: 2123

relative risk based on the probability of an attack and the vulnerability of a site to an attack. Vulnerability is partially based on susceptibility, which in turn is partially based on the accessibility as determined by the simulation described above; and partially based on a consequence calculation. . . . In highly preferred embodiments, the risk assessment tool is implemented using a Bayesian influence network. The network is based upon input from experts in the anti-terrorism field.

According to the Specification at page 11, the “Computational Engine 230” calculates risk values using “elaborate artificial intelligence and simulation algorithms” (emphasis added):

The Computational Engine 230 combines user-entered data, along with data stored in the Database module 230, to calculate risk and all of its underlying components. The Computational Engine 230 uses elaborate artificial intelligence and simulation algorithms to analyze and assess the specific targets, threats, vulnerabilities, and ultimately, the risks at a user’s site.

According to the Specification at page 12, the Computational Engine 230 uses an “Influence Network 500” to quantify risks (emphasis added):

The foundation for the Computational Engine 230 is the Influence Network 500 shown in Figure 5. The network 500 [sic] shows all of the nodes 510, 510a that ultimately affect the risk of a given threat against a given target. The values for each of the nodes 510, 510a are combined using probability and statistics equations that account for the weighting of the various nodes and the uncertainty in their values.

...

This network 500 [sic] also provides a rigorous, quantitative calculation of risks.

Art Unit: 2123

The Specification later describes the use of Bayesian networks in the Influence Network 500 on pages 22-24, including use of conditional probability tables. On page 23, the Specification states that (emphasis added): “Although the probabilistic inference of the network 500 [sic] requires complex mathematical operations, the structure of the network 500 [sic] is simple to represent.”

5.3 A review of the Specification indicates that probability and risk calculations are made using a Bayesian network in conjunction with a set of probability and statistics equations. Although the Specification provides some guidance regarding the structure of the network used, the Specification fails to provide information necessary to construct a Bayesian network that produces accurate results. For example, it is well known that operation of a Bayesian network requires a set of “prior probabilities”; according to Nguyen, “Target Mission Estimation”, IEEE Third International Conference on Knowledge-Based Intelligent Information Engine Systems, pp. 66-69 (August 1999) at page 68:

An assignment of prior probabilities to nodes and conditional probabilities to links is a critical step in the process of constructing a Bayesian network. . . .the conditional and prior probabilities are provided by a domain expert in this study.

The Specification provides no guidance regarding the selection of prior and conditional probabilities, other than stating on page 23 that the conditional probability table is “set by evidence assigned from external data.”

Art Unit: 2123

Although the Specification alludes to use of probability and statistics equations in conjunction with a Bayesian network, the Specification provides no information regarding these equations, other than stating that “complex mathematical operations” are required. Similarly, the “elaborate artificial intelligence and simulation algorithms” that are used in the invention are not disclosed in the Specification.

Taken as a whole, only with undue experimentation could one reasonably skilled in the art make and/or use the invention described in the specification.

***Claim Rejections - 35 U.S.C. § 112, Second Paragraph***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6.1 Regarding claims 1-12, the term “relative risk” is a relative term which renders each claim indefinite. This term is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Although the Specification on page 2 defines the following:

risk = (probability) \* (vulnerability), and

vulnerability = (susceptibility to the event) \* (consequences associated with the event)



Art Unit: 2123

and it appears the units of risk are measured in physical damage such as dollars, it is unclear what is meant by "relative risk".

*Indication of Allowable Subject Matter*

7. Subject to rejections listed above, and based on the prior art located to date and made of record, Claims 1-12 do not appear to be taught or rendered obvious, and are indicated as allowable subject matter.

*Conclusion*

8. The prior art made of record and not relied upon is considered pertinent to Applicants' disclosure. Reference to Nguyen (cited above in Section 5.3), is further cited as teaching the use of Bayesian networks to perform target mission estimation.

Reference to Allen et al, "Modeling Requirements for Simulating the Effects of Extreme Acts of Terrorism: A White Paper", Sandia National Laboratories, Abstract (October 1998), is cited as modeling the effects of extreme acts of terrorism.

Reference to Ojha et al, "Quantifying Operational Risk Using Bayesian Networks and Monte Carlo Simulations", Proceedings of the Second International Conference on Information Fusion, Abstract (July 1999), is cited as teaching modeling of operational risk using Bayesian networks.

Reference to Verton, "Marine Unit Buys Attack-Modeling Software", Federal Computer Week, p. 39 (18 October 1999), is cited as providing a description of the MIDAS-AT software package.

Art Unit: 2123

Reference to Fitzgerald, "Anti-Terrorism Software Models Real Effects of Biological Weapons", Security, pp. 9-10 (July 1999), is cited as providing a description of the MIDAS-AT software package.

Reference to Santoso et al, "Nuclear Plant Fault Diagnosis Using Probabilistic Reasoning", IEEE 1999 Power Engineering Society Summer Meeting, pp. 714-719 (July 1999), is cited as teaching use of Bayesian networks for fault diagnosis.

Reference to Bakert et al, "Force Aggregation via Bayesian Nodal Analysis", IEEE 1998 Information Technology Conference, pp. 6-9 (September 1998), is cited as teaching use of an evidence network to classify military units.

Reference to Ogunyemi et al, "Probabilistically Predicting Penetrating Injury for Decision Support", IEEE 1998 Symposium on Computer-Based Medical Systems, pp. 44-49 (June 1998), is cited as teaching diagnostic reasoning using Bayesian networks.

Reference to Geiger et al, "Probabilistic Relevance Relations", IEEE Transactions on Systems, Man, and Cybernetics--Part A: Systems and Humans, Vol. 28 No. 1, pp. 17-25 (January 1998), is cited as teaching use of Bayesian networks to define "probabilistic relatedness".

Reference to Goldszmidt et al, "Plan Simulation Using Bayesian Networks", IEEE Proceedings of the 11<sup>th</sup> Conference on Artificial Intelligence to Applications, pp. 155-161 (February 1995), is cited as teaching the modeling of military actions using Bayesian networks.

Art Unit: 2123

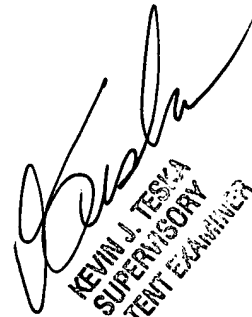
Reference to McMichael, "BARTIN: Minimizing Bayes Risk and Incorporating Priors Using Supervised Learning Networks", IEE Proceedings F - Radar and Signal Processing, Vol. 139 Issue 6, pp. 413-419 (December 1992), is cited as teaching a minimum risk decision scheme in a two stage structure.

Reference to Anonymous, "Science and Technology: Serious Games", Economist, pp. 81-82 (8 July 2000), is cited as disclosing the "Site Profiler" software package.

9. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Samuel Broda, whose telephone number is (703) 305-1026. The Examiner can normally be reached on Mondays through Fridays from 8:00 AM – 4:30 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kevin Teska, can be reached at (703) 305-9704. The fax phone number for this group is (703) 308-1396.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the group receptionist, whose telephone number is (703) 305-3900.



KEVIN J. TESKA  
SUPERVISORY  
PATENT EXAMINER